An Economic Analysis of Watermelon Marketing In Oyo State, Nigeria

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Abstract
The study was carried out to examine the economics of watermelon marketing in Oyo state. Primary data were collected from a sample of 79 watermelon marketers selected from four major markets of Oyo State. Descriptive, budgetary and inferential statistics were used to analyze the data. The results showed that 53.2% of the respondents were between 31-40 years of age while 24.1% were younger. More males (59.5%) than females were in the business and the Hausa tribe dominated the market may be due to the supply source of the watermelon. Seventy-five75% of the respondents were married, while majority of the respondents (54.4%) had no formal education and most of these respondents had only between 1-5 years in the business. The study also revealed an average gross margin per respondent of ₦ 30,584.45 per month while benefit to cost ratio and rate of return were 1.62 and 0.62 respectively. The profitability and efficiency ratio also revealed that watermelon market is profitable and efficient. It was also revealed that there was price discrimination and product differentiation in the market based on size and quality of the product while traders association exists only at retail level. Regression models revealed that tribe of the marketers, amount of initial capital and type of seller were the determinants of gross margin in watermelon marketing.
Keywords: Watermelon, Marketing, Gross margin, Performance, Oyo State

Introduction

Watermelon (*Citrullus lanatus* L.) is a crop of the family *cucurbitaceae* which is appreciated by many people across the globe being a fresh fruit with low calories. It is highly nutritious, with high water content that helps quench-thirst and contains vitamin C and vitamin A in the form of beta-carotene. According to Adekunle *et al.(*2009), watermelon also has Potassium which helps control blood pressure and prevent strokes. It is considered to originate from Africa, though Livingstone found it growing wild in 1854 on the continent of America. In Nigeria, watermelon grows well both in the humid and drier savanna agro ecologies but because it requires warm climate and relatively long growing season, and drier climates make foliar diseases less destructive (Adeoye *et al.*, 2009).

The global consumption of the crop is greater than that of any other cucurbit but as important as this crop is, few people are aware of its market potentials (Adeoye *et al.*, 2009). Watermelon is the most preferred exotic vegetables among Cabbage, Cucumber, Tomato and others in Ibadan Metropolis. This group of vegetables generates better returns, provides more employment and income to the farmers than the indigenous vegetables (Adekunle *et al.*, 2009). It was reported that quality and maturity are of prime importance in marketing watermelon followed by synchronizing the local harvest time with time of short fall in supply from the northern part of Nigeria where large scale production is carried out under irrigation (Afolabi, 2004). As reported by Aremu (2011) socio-economic characteristics of vegetable farmers greatly influence their productivity, costs and returns and eventually their profitability. Similarly, socio-economic characteristic affects decision making and level of use of conventional inputs and other technology (Adebayo and Onu, 1999).

Watermelon has become one of the fruits with high demand in Nigeria and a single fruit may cost between five to seven hundred naira in some States such as Lagos, Abuja and Oyo States. These States receive several tonnes of watermelon daily and yet, supply is always less than demand across the country (Nigerian Dailies, 2010). According to Adeoye *et al.* (2009) watermelon seeds are excellent sources of protein both essential and non-essential amino acids and oils. The seeds contain about 35% protein, 50% oil and 5% dietary fibre. It is also rich in micro and macro nutrients such as Magnesium, Calcium, Potassium, and Iron. Beside the red flesh, the Arabs consumed the salted and roasted watermelon seeds as snacks while the fruit is regarded as a major source of income to an average resident of Bara in Bauchi State of Nigeria. The production of watermelon is mostly from the northern part of the country due the availability of suitable weather condition and hence, the Hausa tribe dominate the market. As the awareness of the health benefits of the crop increases in Nigeria, there is now high demand for it especially in the south-western Nigeria. This thus implies encouragement and higher income to farmers.

Recently, watermelon has now become a common fruit that both the rich and poor are craving for and it is not uncommon to see the marketers selling the fruit along the major and minor roads of the urban Nigeria. In order to meet customers' needs at various levels, the marketers now sell different sizes either as a whole or sliced forms. This makes the fruits more affordable for the consumers. Though watermelon production is considered a lucrative business in Nigeria, little is known on how to ensure its efficient distribution in a way that will maximize the economic returns to both the farmers and the marketers; this may be due to its newness to the markets in South-western Nigeria. This dearth of information on marketing of watermelon makes its marketers to have less profit compared to what they could have made. The major objective of this study is to analyse the marketing of watermelon in Oyo State. Specifically, it (i) examined the socio-economic characteristics of watermelon in the study area. (ii) examined the profitability of watermelon in the study area. (iii)

examined the market conduct and performance of watermelon in the study area (iv) examined the factors that determined the gross margin of watermelon in the study area. This study will reveal the employment opportunities embedded in marketing watermelon which has never been fully explored due to its newness in the study area. This study will also serve as a guide manual to prospective investors on watermelon marketing and investment decisions.

Marketing margin is the difference between producer and consumer prices of an equivalent quantity and quality of a given commodity (Afolabi, 2009: Vanessa and Jonathan, 1992). Olukosi *et al.* (2005) viewed marketing margin as the difference in price of a given commodity as it moves from the primary producer to the ultimate consumer. Adekanye (1988) claimed small margin to be an evidence of efficient marketing but Vanessa and Jonathan (1992) refuted that gross marketing margin cannot be treated as an indicator of economic performance since such low margin may exist together with inefficient use of resources, poor coordination and poor consumer satisfaction including disproportionate profit level.

Market structure is defined as those characteristics of an organization of a market which seems to influence strategically the nature of competition and pricing within the market (Olukosi *et al.*, 2005). Adegeye and Dittoh (1985) referred to market structure as concerned characteristics of the market which are believed to influence its nature of completion and price formation. The setup of the market consist of the degree of concentration of buyers and sellers, integration, product differentiation and the degree of competition between buyers and sellers (Afolabi, 2009). Afolabi (2004) reported that majority of the sellers of agricultural product used both open display and persuasive methods to draw the attention of customers while Imuodu and Afolabi (2002) concluded that market structure for agricultural product in Nigeria is not perfectly competitive due to collusive tendencies of sellers in forming associations for particular product.

Materials and Methods

The study was carried out in the major markets of Oyo State, Nigeria which lies between 7˚and 9.3˚N and longitude 2˚ and 4˚E. Oyo state is one of the six states that make up the south- western Nigeria and has Ibadan which is the largest city in West Africa as its capital. Ibadan has population of more than one and half million with several major markets for fruit and leafy vegetables (NBS, 2006). Oyo state is characterized by two climatic seasons and they are the dry season that occurs between November and March and the rainy season that occur between April and October. Oyo state covers 35,743 square kilometers and has a total population of 5,591585 (NPC, 2006). Oyo state is bordered in the North by Kwara State and Osun State and in the west by the Republic of Benin. The strategic location of Oyo state allowed the development of good markets for agricultural products. There are several identified major terminal food markets which serve as meeting points for middlemen, buyers and farmers in Oyo State. Apart from the urban markets such as

Shasha, Sabo and Bodija markets which are the largest food produce markets in Ibadan, there are also several local food and vegetable markets in its nooks and cranny where buyers meet on daily, five day, or nine day sequence especially in the rural areas (Adeoye *et al.*, 2009). A typical vegetable market in Oyo state is generally localized and consists of numerous independent small scale farmers, wholesalers, static and/or itinerant retailers who buy from the farm gate usually with nowhere to continue the marketing functions but further by re-selling the produce at the nearest market places.

Sampling Techniques
A multi stage sampling techniques was used to select 100 watermelon marketers. The first stage involved a purposive selection of Ibadan North Local Government Area (LGA) and Akinyele LGA based on *a priori* expectation that the two LGA have effective markets for watermelon; and both men and women are actively engaged in watermelon business. The second stage involved a random selection of market from each LGA namely. From Ibadan North LGA, Bodija and Sabo markets which are one of the destinations of watermelon that comes directly from the north were selected while Shasha market which is a major market for fruit vegetables was selected in Akinyele LGA. The last stage involved random selection of 100 respondents across the three markets using simple random sampling technique but only seventy nine (79) of the questionnaires were recoverable and used for the study.

Analytical Technique
Descriptive statistics such as frequency counts, percentages and tables were used in the study. While inferential statistics such a gross margin and regression analysis were used to interpret the data. In the analysis, gross margin was used as the dependent variable while the socio-economic characteristics were the independent variables. Implicitly, the equation is thus;
G M = $F(X_1, X_2, X_3, X_4, X_5, X_6, D)$ (Oluwadare *et al.*, 2009; Ndaghu *et al.*, 2011). Where,
 G M = Gross margin (Dependent variable)
X_1 = Marital Status (D = 1, If married and 0 if otherwise); X_2 = Educational level (Years) ; X_3 = Tribe of the marketer X_4 = Marketing experience (Years)
X_5 = Amount of initial Capital (Naira); X_6= Type of seller (wholesaler; wholesaler/ retailer; retailer) ;   F = Functional Relationship; *D = Dummy variable

Budgetary Analysis
Budgetary analysis was constructed to estimate the marketing cost, revenue and gross margin of the marketers. Gross margin analysis was used to access the net return of both wholesalers and retailers in the study area. This was based on the formula:

G M =T R - TVC
Where,
G M =Gross margin;   TR =Total revenue ; TVC = Total variable cost.
Net profit =TR-TC;   TC=Total cost
Benefit-cost ratio was calculated as the ratio of total revenue to total marketing cost.

Results and Discussion
Socio-economic Characteristics of respondents
Table 1 shows the age distribution of respondents. Majority of the respondents (53.2%) were within the age range of 31-40 years while 24.1% were even younger. A total of 82.4% of the respondents were thus less than 50 years old. This implies that most of the respondents were young and in their prime age in terms of marketing efficiency. This is expected to have a positive influence on their returns and ability to take business risks. 59.5% of the respondents were males while the remaining 40.5% were females. This is because the dominant tribe among the marketers is those that do not believe in exposing their females to the public let alone marketing of goods. It was found that it was their men that often do outside works while the women stay at home and engage in sedentary works.
The result also revealed that 75% of the respondents were married while 25 % were singles. This suggests that watermelon marketing is appropriate for both married and singles. It thus confirms Taphone (2009) who reported that married people have more responsibilities in taking care of their family members and this may be the reason why the business is dominated by them so as to be able to meet these responsibilities. Table 1 also showed that 54.4% of the respondents had no formal education, 19.0% had only primary education and 26.6% had secondary education. This revealed that literacy level among the marketers is low. This is not surprising since watermelon is mostly produced in rural areas of Northern Nigeria but transported down south for marketing. This finding agrees with Adekunle *et al.* (2009) who reported that most farmers in Nigerian rural areas are limited in terms of formal education. Hence, many rural dwellers who are presently active participants in the market channels have little educational qualification since they could not see it as prerequisites.
It was also shown in table 1 that majority of the marketers (84.8%) are Hausas, 10.1% are Yorubas and 5.1% are Ibos. This suggests that the source of any commodity has influence on the actors in its marketing channels. Hence, having higher percentage of Hausa in marketing watermelon may be because of their access to fertile land and good weather conditions that support high production of the crop than any other place in the country. This result also suggest that there are few southerners involving in watermelon marketing and thus confirm Afolabi (2004) who claimed that watermelon marketing is new to the market in the south-western Nigeria and though southerners are aware and enjoys its nutritional contents, only few of them engage in its marketing. This implies that adequate awareness on the

profitability of the crop is necessary so that the people can also benefit apart from its nutritional contents but also on its financial returns. Table 1 also revealed that 62.0% of the respondents have between 1 to 5 years of the business experience, 22.8% had between 6 to 10 years of experience, and 12.7% had between 11 to 20 years while only 2.5% had more than 20 years of the business experience. This implies that most of the marketers are new in the business and might not be able to effectively explore the business opportunities. This therefore agrees with Adejobi *et al*. (2011) who claimed that the more the number of years a marketer engage in a business, the better he will be equipped in exploring the business opportunities due to business tactics and networking he would have developed over the years.

Table 2 shows that the gross margin of marketing watermelon is ₦ 30,584.45 per marketers per month while its Benefit cost ratio and rate of return are 1.62 and 0.62 respectively. This indicates an increasing return to scale with every ₦ 100 investment yielding ₦162. The Benefit cost ratio of 0.62 showed that marketing watermelon is a profitable venture in the study area since every ₦100 invested in the business gives a return of additional ₦ 62.0 over and above the amount invested. This confirms Aremu (2011) who reported that marketing of fruit vegetables such as tomatoes is a highly profitable business in south-western Nigeria. The profitability ratio as shown in table 2 means that for every ₦ 100 invested in the business, marketers gained ₦ 62.0 in the study area. Hence, the marketer makes more than 60% profit from the trade and this agrees with the earlier result obtained under cost and return analysis.

Efficiency ratio: The estimated efficiency ratio was 1.62 which is greater than unity. This thus indicates that the operations involved in marketing watermelon are efficient. This result therefore confirms Adeoye *et al.* (2009) who claimed that marketing watermelon is a profitable venture not yet explored in the study area.

Conduct and Performance of Watermelon Markets

In table 3, market conduct for watermelon in the study area revealed that all respondents determined their prices using some factors such as forces of demand and supply, cost of acquisition, season and most importantly the ability of buyers to bargain. This bargaining power of the buyers revealed that different marketers sell the same products at different price which means there is price discrimination in watermelon market. Also, there was high degree of product differentiation in the market based on sizes of the fruits, sweetness, quality and species of the fruits. Watermelon trader association occur only the retail level but the market is easily

Multiple Regression Models

Out of the four functional forms tried for the analysis, exponential functions gave the best fit due to its high adjusted R^2 value and high significant variables. Hence, it was chosen as the lead equation. Its explicit form is presented as follows:

$GM = -149.199(-2.945)** - 0.369X_1(-0.645) - 0.575X_2(-1.322) - 55.793X_3(-3.417) ***$
$- 0.811X_4(-0.873) + 0.000X_5(3.611)*** + 108.814X_6(0.005)***$
$R^2 = 0.840;$ $Adjusted\ R^2 = 0.776$ $F = 13.150$

From the regression result, six explanatory variables were used which include marital status, educational background, tribe, marketing experience, amount of initial capital and type of sellers. Three of these variables namely tribe of marketers, amount of initial capital and type of seller all significantly influence the gross margin at 1% level. The regression result revealed that the coefficient of tribe of the marketer has negative relationship with the gross margin. This means that with a single tribe (Hausa) dominating watermelon marketing activities, the gross margin obtained from the business will be reduced. Hence, the more the number of tribes that engages in the business, the higher will be the gross margin realizable. This may be due to increase in revenue from specialization and networking involved along the marketing channels. Also, Amount of initial capital and type of seller has positive influence on the gross margin. This means that the higher the initial capital each marketer is able to invest in the business, the higher will be the gross margin *ceteris paribus*. This result confirms a report by Nigerian Dailies (2010) which stated that "the demand for watermelon across Nigeria keeps increasing on a daily basis and supply is always less than the demand. No matter the amount of watermelon a marketer brings to the markets either as a producer, wholesaler or retailer, there is always a ready market and this suggests that he/she will always enjoy high gross margin since watermelon marketing is yet to be adequately explored". The results also shows that estimated coefficient of multiple determination (adjusted R^2) indicates that the explanatory variables explained 77.6% in the variation of the gross margin while other variables which accounts for the remaining 16.0% were not included.

Conclusion

Marketing of watermelon is carried out mostly by young and middle age people. The rate of returns and benefit cost ratio indicated that it is a profitable business. Most marketers had only 1- 5 years experience due to the newness of the crops in south-western markets and most of the actors in the market are Northerners. The efficiency ratio showed that operations in watermelon marketing are efficient. The tribe of marketers, amount of initial capital and type of sellers have significant impact on the gross margin realized in the business. It is thus recommended that awareness of business opportunities in marketing of watermelon should be increased especially in southwestern Nigeria in other to draw the attention more marketers to it.

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Table 1: Socio-economic Characteristics of Watermelon Marketers

Variables	Frequency	Percentage
Age (Years)		
20-30	19	24.1
31-40	51	64.5
41-50	04	05.1
> 50	05	6.3
Gender		
Male	50	63.3
Female	29	36.7
Marital status		
Single	23	29.1
Married	56	70.9
Educational background		
No formal school	43	54.4
Primary school	15	19.0
Secondary school	21	26.6
Tertiary school	00	00.0
Tribes		
Yoruba	08	10.1
Hausa	67	84.8
Igbo	04	05.1
Marketing Experience (Years)		
1-5	49	62.0
6-10	18	22.8
11-20	10	12.7
> 20	02	02.5

Source: Field Survey, 2014

Table 2: Measure of Market Performance (Profitability and Efficiency ratios) per month

Variables	Value ₦
Total Revenue	6,309,244.07
Total Revenue/marketers	79,863.85
Total Variable cost	3,893,151.67
Total Variable Cost/ marketers	49280.40
Gross margin (GM)	2,416,092.40
Gross margin/marketer	30,584.45
Profitability ratio (GM/TVC)	0.62
Efficiency ratio (TR/TVC)	1.62

1USD = ₦200

Source: Field survey, 2014

Table 3: Market Structure and Conduct of Watermelon

Characteristics		Frequency Percentage(%)
Price determination		
Forces of demand and supply	32	40.51
Cost of acquisition	20	25.32
Quality of product	15	18.99
Quantity of watermelon in the market	06	07.59
Ability of buyers to bargain	06	07.59
Methods of attracting customers		
Open display	50	63.29
Persuasive effort	10	12.66
Quality product	12	15.19
Discounted price/ extra	07	08.90
Differences in watermelon sold in the market		
Yes	70	88.61
No	09	11.39
Existence of watermelon marketing association.		
Yes	00	00.00
No	79	100.00

Source: Field survey, 2014

Table 4: Regression Analysis

Variables	Parameters	Coefficient	t-Ratio
Constant			-2.945**
Marital status	X_1	-0.074	-0.645
Education background	X_2	-0.180	-1.322
Tribe of marketers	X_3	-9.333	-3.417***
Marketing experience	X_4	-0.094	-0.873
Initial capital	X_5	9.951	3.611***
Type of seller	X_6	12.560	3.301***
R-Square	0.84		
Adjusted R-Square	0.776***		
F =	13.150***		

***;** : indicates 1% and 5% level of significant respectively
Source: Field survey, 2014